Dear dairy

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Unlocking the secrets of
the best-performing dairy
farms in the world

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Dear Dairy,

We're excited to share our dairy farming knowledge with others who are as passionate as we are about the success of dairy farms. Nedap has been at the forefront of bringing innovation and technology to livestock management. Our RFID and monitoring solutions play a vital role in providing real-time data about individual cows and herds, and we're leading the way in bringing cow locating and augmented reality technology to the dairy farm.

On the following pages, you'll learn about Nedap's solutions for on-farm challenges like herd health, labor efficiency, milk production, reproduction and feed nutrition. Our goal is to help you unlock the secrets to improving the efficiency, sustainability, productivity and profitability of your dairy operation – the way the best-performing dairy farms in the world do it.

Nedap is using innovation in technology to contribute to a healthy future for livestock farming. Our global distribution and support network, together with our team of experts, can provide the individual service and on-farm support needed when you're ready to take the next step.

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We are learning fast when it comes to sensors for dairy cows. But what are the latest innovations and insights? Dairy Global talked to Arnold Harbers from Nedap about what is yet to come.

What makes a good sensor

Q&A with Arnold Harbers, Data Analyst at Nedap Livestock Management

Sensors are making their way to dairy farms around the world. Often, sensors are used for heat detection. But sensors can tell us so much more. Think of data around eating, rumination, inactivity, location, lying, standing, number of steps and the number of times the cow stands up. To speed up our knowledge about this, Nedap started an extensive field study in 2016, on 8 dairy farms, together with Utrecht University, Wageningen University and Research Centre and Vetvice Consultancy in the Netherlands. Arnold Harbers, data analyst at Nedap is actively involved in this field study and explains more. >>>

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Q Nedap calls this project 'Sense of Sensors in Transition Management'. What does this project entail and why did you start it?

A The goal of the project is to create tools that can help farmers improve their dairy cow transition management. Ultimately, we want to make it possible for every cow to transition healthy. That is of course ambitious but I believe it is good to have big dreams. The information from the sensors can identify areas for improvement, can show effects of management changes and can monitor transition management. In this project extensive health checks are done by veterinarians in the pre-fresh and fresh cows, and sensor data is collected from all cows on 8 dairy farms. Together with the production and reproduction data of these cows we can identify the cows with a successful transition. From the sensor data we want to extract 'feed forward indicators' to monitor and improve transition management.

Q Are farmers ready or trained enough to transform data from sensors into useful information? For example: Who determines if the cow is not lying or eating well?

A "Having sensors is one thing, but it is important that sensor data is turned into user friendly alerts, worklists, reports, barn maps and insights. This way, it answers the questions that farmers have, such as: Which animal needs immediate attention? (urgent health attentions and heat alerts), which animals need treatments regarding fertility or diseases and what happens if I change feeding strategies, milking

procedures or housing conditions? Group and herd performance and behaviour reports give insights on where to improve on in the long term. Sensor technology helps farmers to answer these questions. The farmer can then decide how to act on it."

Q In the project you talk about 'feed forward' instead of 'feedback'. What do you mean with that?

A "Feedback looks at the history. You can learn from it, and you can use it to set targets and thresholds. However, you cannot act on it. To be in control and to steer, you are too late with the historic data. Think of days the cows are open, last week's rumination time and the percentage of cows with retained placenta. Using feed forward data provides information that will guide results in the future. When feed forward indicators are good, the process will produce results that match your end goals. When they are not ok, you will want to correct things. For instance, the body condition score (BCS) during the dry period is a feed forward indicator for fresh cow problems. Eating time, rumination time, feed intake, rumen fill, and BCS during the start of lactation are feed forward for the process of getting cows pregnant. In our project we focus on these feed forward indicators. We believe these types of indicators are very promising and are under-represented in the current indicators available to producers." **>>>**

Q How can sensors help the modern dairy farmer manage large herds?

A "Sensors are a very good way to keep a close eye on the fertility, health, well-being and location of every cow. And this can be done 24/7. This is important as farms and herds are getting bigger. Farm owners struggle to get qualified, motivated and affordable staff. In addition, sensor technology makes it possible to implement 'management by exception' on large farms. This means: only focus on those cows that need attention while not disturbing daily routines of the cows that do not need attention or treatment. Think of

Reduced eating and ruminating makes the cow less active. And an inactive cow means a potential health issue.

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dairy cows as workaholics. They need to spend a lot of time feeding and lying without interruption. Lockup time is a huge interruption in the daily routine of a dairy cow. Minimising lockup time is a good way to improve the life of a dairy cow. She will reward you with higher milk yields. Sensors have the potential to reduce lockup time because you do not need to lockup the entire group for cow checks and treatments. Sensor information can also be used at operational, tactical and strategic levels. Operational level is the daily work that needs to be done. Tactical and strategic levels focus on the mid and long term. Sensors can help because they actually show

what your cows are doing. If you decide to improve your feed management (diet composition, feeding time, push ups, etc) the sensors will tell you if your cows think it is an improvement too. Together with the milk production and reproduction results of your cows this gives you an answer whether the change in feed management was a true improvement."

Q In the near future, can or will sensors replace the farmer in detecting sick or pregnant cows for example?

A "Well, the sensors can give an automatic alarm, such as: 'This cow shows abnormal behaviour.' This is a very helpful tool. But with proper cow observations, like monitoring temperature, BCS, locomotion, hygiene, manure, rumen fill and milk production, currently available sensor technology will not often point out a truly sick cow that that would otherwise not be detected. Sensors can confirm your suspicion that a cow is struggling. Plus, they can give you a better impression of how sick a cow is and how long it has been having problems. Practice also proves that sensors usually detect symptoms of health issues one to three days earlier than farmers are able to with their human eye. Skilled people are still necessary to make the final call, but sensors often detect problems earlier and add extra information to this process so they can make better decisions.Sick cows are a good example of a feedback indicator: once the cow is sick, you are too late. With sensors we want to identify at-risk cows. This is a feed forward indicator because you have the opportunity to prevent the cow from becoming truly sick." **>>>**

Q How can sensors help to better understand and improve transition management?

**A** "The transition period is a very delicate period for the dairy cow.
A perfect start after calving ensures a healthy lactation with good production and fertility. For example, it is important that the cow eats enough before calving and straight after to be able to maintain the milk production at a high level. By monitoring eating behaviour we make sure there is a sufficient and stable feed intake. Measuring rumination is important to make sure there are no problems in the rumen that can lead to ketosis, acidosis, displaced abomasum (DA) and milk fever. Activity sensors are key as they measure how active the transition cow is. Reduced eating and ruminating makes the cow less active. And an inactive cow means a potential health issue. These changes are subtle and difficult to observe by people. We already see that cows that develop ketosis spend less time eating and ruminating in the entire dry period. This change is consistent, but less than an hour per day. Sensors can track these changes and notify you which animals are at risk for developing ketosis. This gives you the option to treat this cow and help her to a good start of the lactation."

Q Will you continue to run the project in the coming years and what are still the knowledge gaps in using sensors and the data?

A "This study will continue for several years. We are at the start of discovering all the possibilities to improve transition management. That is a really exciting journey and I am anxious to know where we will be in a couple of years. I think the biggest knowledge gap we have right now is to define the success factors of a healthy transition and to understand what is happening when a cow goes through transition. Once the success factors are known, we can develop effective feed forward indicators that the sensors can measure. Producers can use these indicators to improve their transition management and that should ultimately result in a healthy transition for every cow."
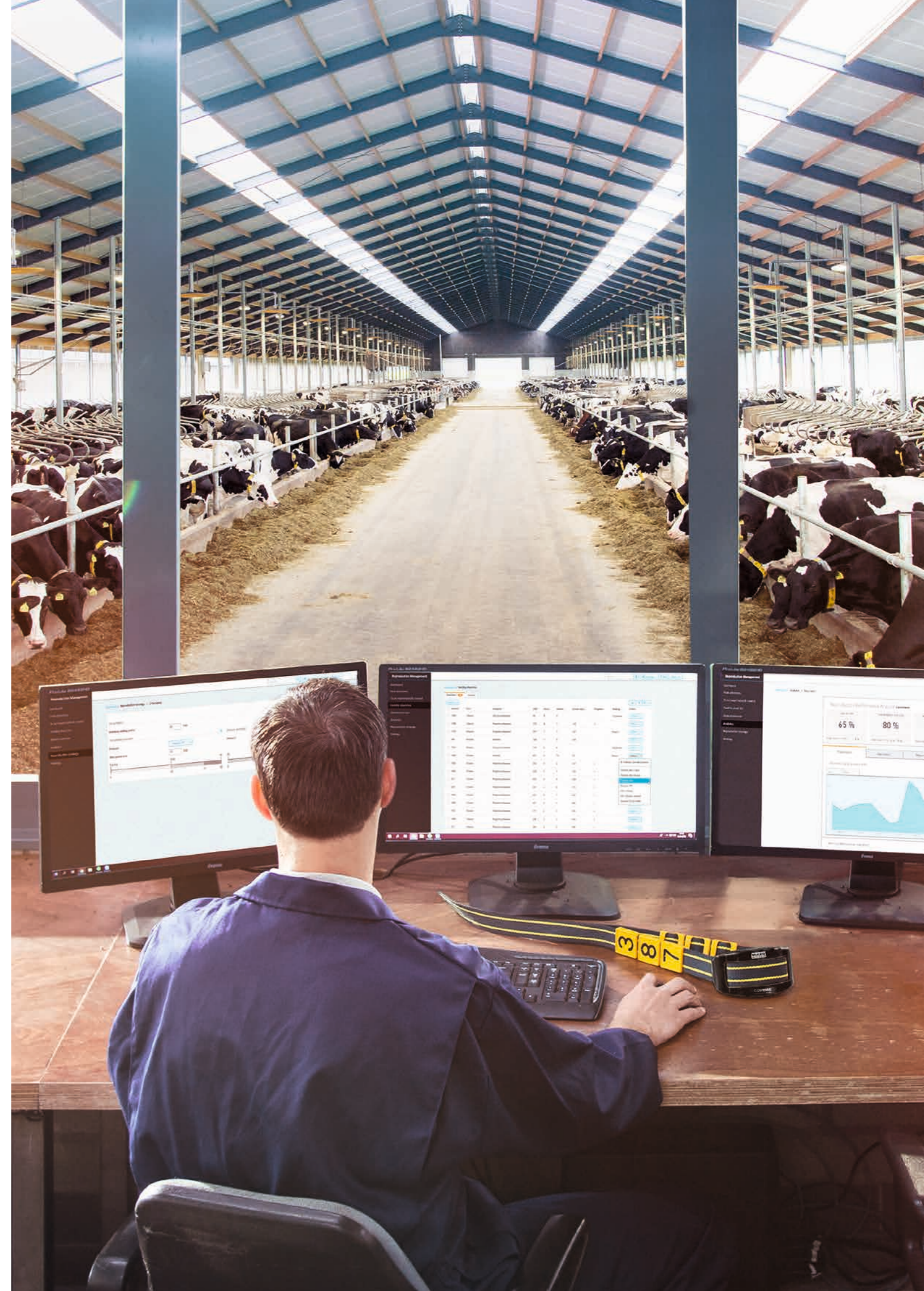
Two reasons activity monitoring matters for reproduction

by **Carlijn Gieling**
Accountmanager at Nedap

Understand your cows' estrous cycles with 24/7 activity and performance insights.

If an open cow costs $2.00 or €1,70 per day, then a single missed heat can cost you $42.00 or €36. In today's dairy economy that's a lot of money to use someplace else, especially if multiple heats are missed.

"When heats aren't detected, it leads to more time and labor spent tracking, sorting and breeding cows," says Carlijn Gieling, accountmanager for Nedap. "Activity monitoring systems help dairy farmers catch cows in heat for timely insemination."

Here are two reasons an activity monitoring system can get more cows pregnant faster and keep money in your pocket. **>>>**

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Help improve conception rates

Detect heats 24/7

Find anestrous cows
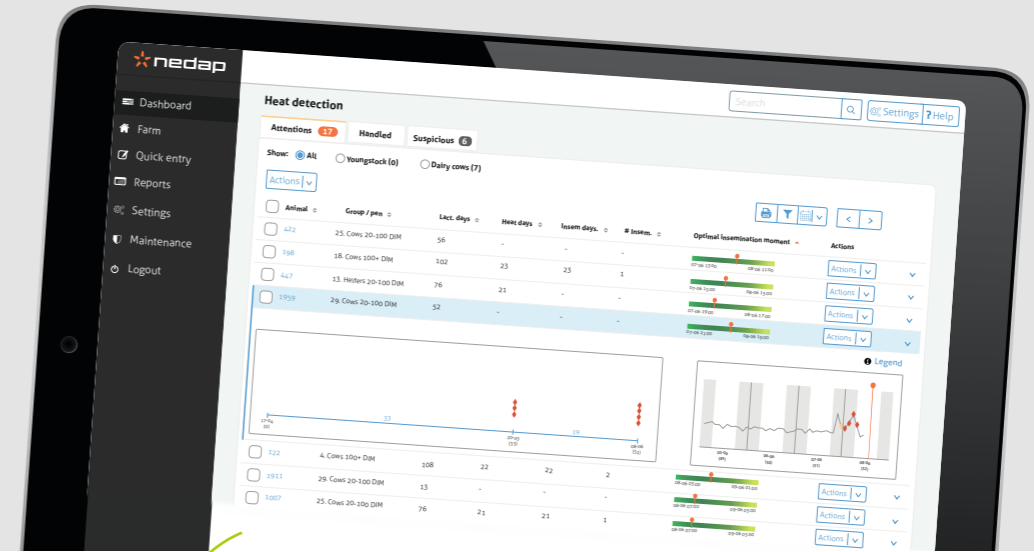
Track cow activity 24/7

Although you can visibly detect a cow standing to be mounted, it is not fail-proof. And it's not realistic to monitor cows 24/7.

There are only 1.5 mounts per hour per cow and each mount lasts 4-6 seconds[1]. The average duration of standing heat is 15 to 18 hours, but it can be as low as 4 hours. That's a very small window to catch a heat.

Heat activity of cows tends to be lowest during feeding and milking times – the times you or your staff are most likely with the cows. Furthermore, a lot of the heat activity occur when you are probably sleeping: when cows have limited distraction from feeding and milking.

"Activity monitoring takes on the full-time job of heat detection," says Gieling. "These systems also rely on other indicators, like sniffing and chin resting, to make sure heats don't get missed. Data can also provide actionable insights about the optimum time to inseminate for the highest chance of conception." >>>

Reason 01

Chance of conception (in %)

← 0% - 100% →

Duration of heat
in hours
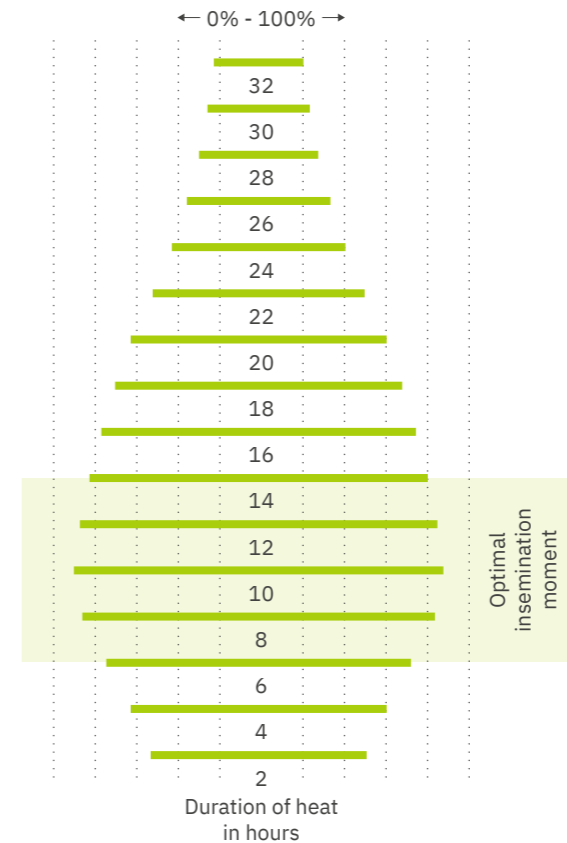
Optimal insemination moment

Reason **02**

Quickly find cows not showing heat

Sometimes a cow won't show a heat because of environmental or metabolic factors, like floor surface, sore feet or legs, heat stress or ketosis complications. Also, she simply may not be cycling (annovular). With an activity monitoring system, you can act proactively by finding these problem cows quicker, then solving the cause of the fertility problem or providing an effective treatment to resolve it – ultimately, getting them bred faster.

"Instead of missing the heat altogether and waiting for the next cycle, activity monitors give you insights to dig deeper into why a cow didn't come into heat," says Gieling. "Insights from data can help you make a management decision to get a cow bred as quickly as possible, regardless of why she isn't showing heat."

Using an activity monitoring system allows you to catch cows in heat and take early action when there's a problem. The result? Improved reproductive outcomes and money in your pocket.

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Two ways activity monitoring can help find ketosis
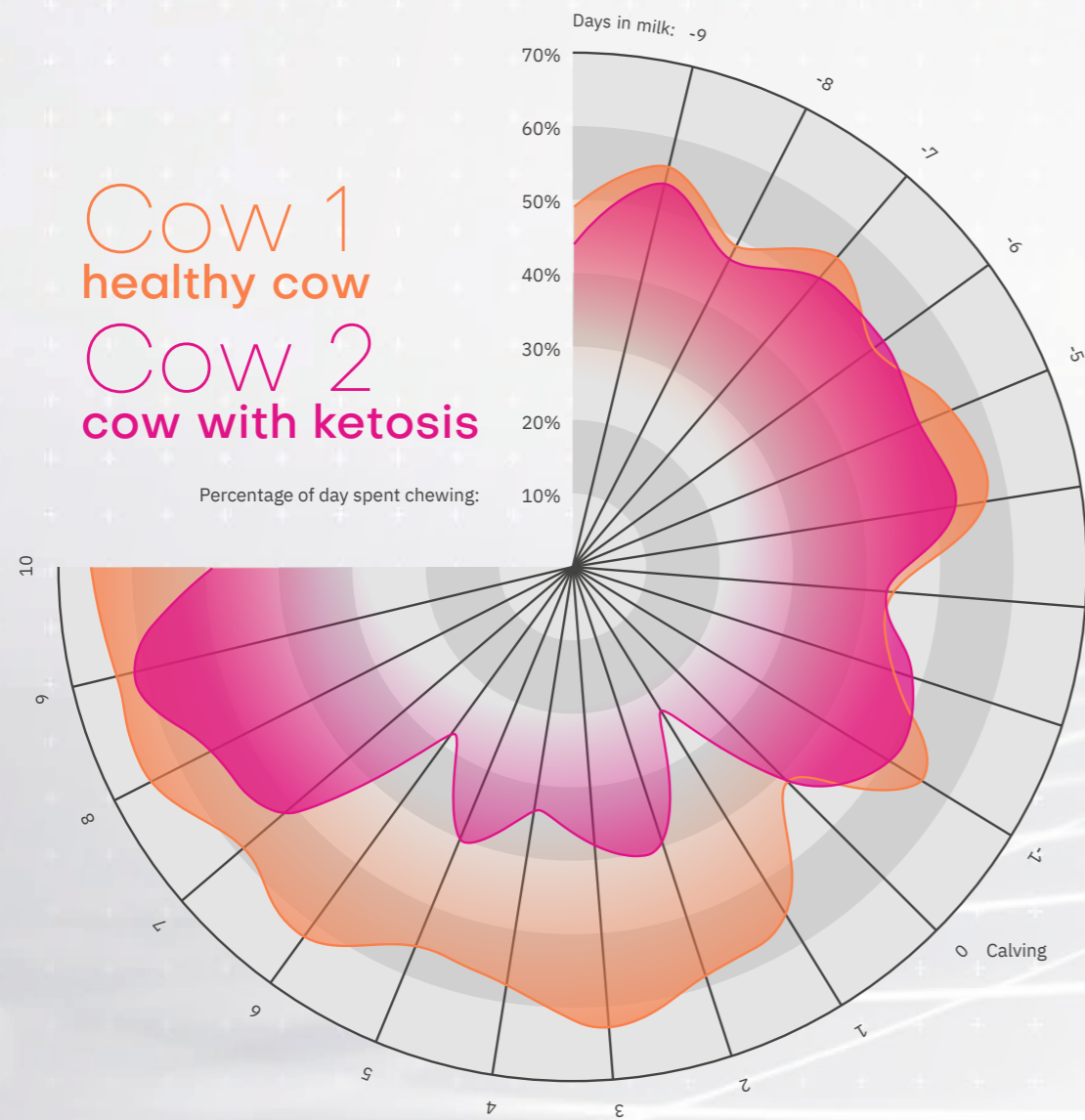
by **Eveline de Pont**
Product Owner at Nedap

If you own an activity monitoring system, you know the efficiencies you can gain on farm.

Time, labor and decision making, to name a few. But, with any piece of technology, there are likely more uses and efficiencies to gain – ones that can help you maximize your return on investment. One area to advance efficiency in is ketosis detection.

"Ketosis monitoring is a natural next step in maximizing the capabilities of an activity monitoring system," says Eveline de Pont, Nedap activity monitoring product owner. "With activity monitoring, each cow can be monitored individually through the transition period and you can compare potential problem cows to the group, to learn if it's a pen-wide management issue or a ketosis case. Farmers looking at this data have been able to successfully decrease ketosis for better ROI."

The results of early detection and prompt treatment (prior to clinical signs) can quickly add up. Ketosis alone can cost a 1,000-cow dairy with a 30% ketosis rate about $87,000 or €73,500 a year. By lowering the ketosis rate by just 5%, the dairy could save $14,500 or €12,250 per year. * >>>

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Cow 1
healthy cow

Cow 2
cow with ketosis

Percentage of day spent chewing:

Days in milk:

1. Monitor individual transition cow activity.

Your activity monitoring system tells you a lot about each cow, including a cow's chewing activity. Chewing activity (eating + rumination) can be a good indicator for ketosis. Look at a cow's chewing activity 10 days before she calves compared to 10 days after she calves. You should see natural peaks and valleys. Chewing time crashes are normal at calving, but cows should begin to rebound within a day or two.

In a real-life example, the accompanied chart shows the chewing time difference between a healthy cow (Cow 1) and a cow with ketosis (Cow 2). Cow 1 bounces back quickly to normal chewing time after calving. Cow 2's chewing time drops significantly the day before calving and stays depressed until day 6, when she receives treatment for ketosis.

Why didn't this cow get treatment until day 6? She wasn't showing clinical signs of ketosis. And even though an alert was sent about Cow 2's increased inactivity (reduced chewing time), she wasn't treated. In an ideal situation, Cow 2 would have been evaluated and treated as soon as the alert was sent (day 1), and she would have bounced back faster.

"For successful early detection and treatment, there has to be a mindset shift," says De Pont.

"We have to get comfortable with letting the data tell us there is an issue versus waiting for clinical signs to appear. You have to fully put your trust into the activity monitoring system to reap the rewards." **>>>**
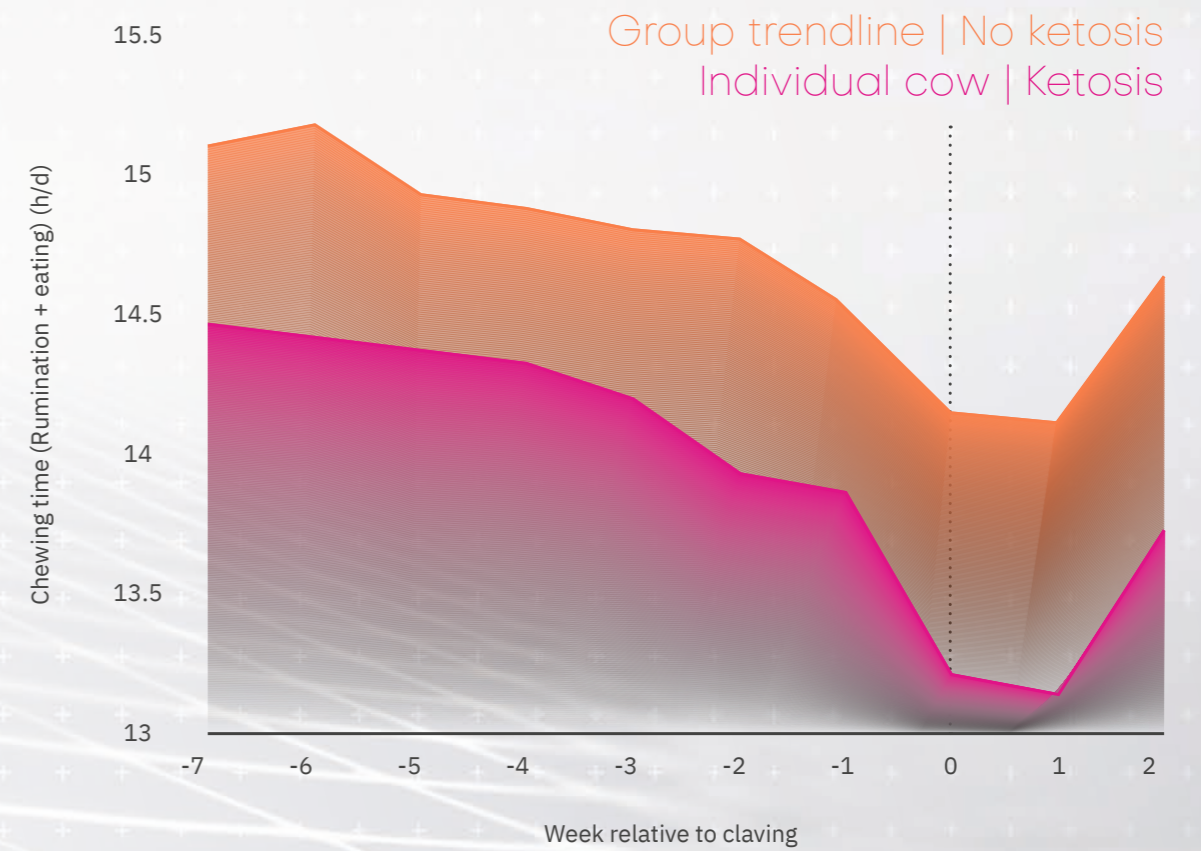
2. Compare the individual cow to its group.

Another ketosis indicator is how the cow is doing in comparison to her pen mates. Look at how a cow's chewing time compares to the rest of her group. If the whole group is experiencing activity or rumination issues, check the pen and the pen's ration. There could be a management issue at hand that needs to be dealt with, like nutrition or environment. If the rest of the group appears healthy compared to individual cow data, you might be dealing with a cow with ketosis.

This chart is an example of what a monitoring dashboard could look like. The orange line represents the average chewing time for a group of healthy cows. The red line represents an individual cow consistently chewing about an hour less than her pen mates, starting seven weeks before she calves. This is not normal and can indicate ketosis.

"A group or pen data pattern shows all cows are experiencing the same environment, nutrition and management," says De Pont. "So, when data shows you a cow is off pace with the rest of the group, you can hone in on other factors, like disease, that can be specific to an individual."

"If there's one thing I'd recommend to farmers to get more from their activity monitoring systems – it would be to trust the alerts you receive and act on them," says De Pont. "Alerts exist for a reason and are there to help you catch things that go unnoticed by the human eye. Catching a disease like ketosis early can help you capture additional ROI from your activity monitoring system."

Group trendline | No ketosis
Individual cow | Ketosis

Chewing time (Rumination + eating) (h/d)

Week relative to claving

by **Bert Uninge**
Global Application
Manager at Nedap

Unlocking secrets to successful transition cow management with data

The importance of transition cow management is well-known. But until recently, there have been unknowns about early disease indicators which impact the health of transition cows and heifers.

Activity monitoring systems have changed the game. The ability to track individual cow activity during the dry period and early lactation has given us a wealth of insights and data – data which has recently been used to identify potential red flags during the transition period for early intervention.

Let's explore some instances where activity monitoring data can be used as an indicator for transition cow success. >>>

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Eating time data and time to first service

Launched in the Netherlands in 2016, the "Sense of Sensors in Transition Management Study" uses activity-monitor sensor data and regular veterinary check-ups to develop early indicators and benchmarks for a successful transition period.

The study recently uncovered a relationship between eating time during transition and earlier first service, which could have an impact on your dry-cow feeding strategy. Dry cows with longer eating time four weeks before calving were ready to be bred back sooner than cows who ate for less time. Cows with longer eating times three to four weeks after calving were also ready to be bred back sooner.

Activity-monitoring systems enable farmers to monitor individual cow and overall herd eating time. These systems send alerts when a cow's eating time drops or when it's lower than the herd average. The alert empowers the farmer to intervene, adjust the feed plan, call a veterinarian or pencil out a new dry cow feeding program. Early intervention can result in improved eating time and cows that breed back sooner.

Eating activity and milk production

Eating data from activity monitoring systems can also indicate a healthy lactation. Low eating time during the dry period can be an early indicator for lost body condition, low milk production, diseases and/or longer time to first insemination during lactation. Feed plan adjustments can be made based on eating time data and desired milk production.

On one farm in the study, fresh heifer milk production was underperforming compared to older cows. Activity monitoring data showed cows spent 24% of the day eating, which is normal. Upon ruling out eating time as an issue, the farmer dug deeper and observed that older, more aggressive cows at the feedbunk were sorting the roughage. As a result, fresh heifers weren't getting the right nutrients.

Activity monitoring data showed immediate desirable changes after the farmer changed his feeding strategy to eliminate sorting. The changes included increased rumination time, increased lying time and less competition at the feedbunk. Younger cows received a better balance of nutrients to help maximize milk production. Average milk production for first-lactation cows increased by 4%.

In this real-life example, activity monitoring data told the farmer fresh heifer eating time was normal. Normal eating time pointed to a potential feed nutrient issue, which he identified visually and was confirmed with sensor data. The data also enabled the farmer to monitor the immediate impact of the management change. This demonstrates how sensor data generates value when paired with farmer knowhow on feeding strategy, feed management and pen characteristics.

Chewing activity and ketosis, hypocalcemia incidence

As we have read earlier on in this magazine, activity monitoring data on chewing activity (eating and rumination) can be used to detect early signs of ketosis and hypocalcemia. Cows that chew less throughout the entire dry period are at higher risk of developing these metabolic diseases.

Based on benchmarks established in the study, activity monitoring can detect subtle changes in eating and rumination activity which are consistent with ketosis

or hypocalcemia, before visual symptoms appear. In one real-life example mentioned earlier in this magazine, cow chewing activity dropped significantly the day before calving and remained depressed until she received treatment for ketosis, which wasn't visibly diagnosed until day six.

Activity monitoring systems will show you when depressed chewing data lasts longer than a day or two. Farmers can then determine if there is a pen-wide management issue or an individual case of ketosis.

Early detection and treatment of ketosis and other metabolic diseases before clinical signs can result in significant
cost savings.

Ketosis' impact extends beyond early lactation, so it's important to catch at-risk cows early and intervene for lactation-long productivity.

Know which cows need attention before putting on your boots

by **Rudy Ebbekink**
Marketing & Communications Manager at Nedap

Imagine starting each day with a list of cows that need attention. You wake up and open an app on your phone, tablet or computer, and the list is waiting for you. Activity and feed intake for cows #555, 579 and 790 suddenly dropped, which could be an early sign of mastitis. Chewing activity for cows #345 and 567 has suddenly dropped, which could be early warning signs for ketosis or hypocalcemia. You can start your day with forward-looking insights like these before you step one foot out of your bed in the morning.

"Automated activity monitoring systems collect data on every cow 24/7," says Rudy Ebbekink, marketing manager at Nedap Livestock Management. Besides heat signs and the cow's location, Nedap's CowControl system monitors eating, rumination and inactive behavior. "The system compares live data to past data on the animal and the rest of the herd. When incoming data is different than what would be expected based on previous data, the system can send an alert to your phone or laptop for intervention." This applies to attentions related to individual cows, but certainly also to groups.

Here are three ways activity monitoring data gives you useful information on individual cows and herd trends.

01 Reduce treatment time of mastitis

What if you could detect acute mastitis and other common diseases earlier? Mastitis is among the most contagious and costly diseases affecting dairy farms. In fresh cows, a case results in an average loss of 357 pounds (406 euros or 475 dollars)[1] and in the UK only, around one million cases of bovine mastitis occur each year, causing 200 millions pounds of losses in production and treatments every year (Science Daily 2008). In the United States for example, mastitis costs dairy producers about 2 billion dollar per year[2]. Activity monitoring data can help you detect early signs of disease and intervene faster, improving outcomes and preventing diseases from spreading throughout your herd.

One of the first signs of acute mastitis, for example, is lack of appetite[3]. And, when the data indicates a sudden drop in eating and rumination time compared to cow or herd historical data, the system alerts you that the affected cow needs attention. If a cow does have acute mastitis, the health alert can help you identify and diagnose it before more obvious symptoms appear like swelling, hardness, redness and heat.

"There are two categories of health attentions," says Ebbekink. "One category is 'urgent attention' and means this cow requires immediate attention. The second category includes cows with more subtle, less sudden changes in behavior. These are the animals that you can focus on during your regular pen walks."

Cows on health attention lists should be evaluated and sent into treatment protocols or isolation for monitoring. >>>

#345 increased inactivity

#54 not cycling

#790 decreased eating

#125 in heat

#579 decreased rumination

#567 increased inactivity

#555 decreased eating

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Health

02

Drive transition period success

Activity monitoring data can also provide useful insights into the transition period from 60 days pre-calving to 30 days post-calving. Cow chewing activity, including eating and rumination, can be used to detect early symptoms of ketosis and hypocalcemia. It can also help determine future reproductive success.

"Cows that eat less during the dry period and the fresh period are at higher risk of ketosis and hypocalcemia," says Ebbekink. "When chewing activity suddenly drops, the system will generate an alert and add her to a list of cows in need of attention. And, by identifying cows with a higher probability of ketosis, you can intervene and prevent lower milk production and lost body condition throughout lactation."

A multi-year study on transition cow activity data by Utrecht University, Wageningen University and Research Centre, and Vetvice Consultancy in the Netherlands has also uncovered benchmarks for future reproductive success. Cows with higher eating times three to four weeks after calving are ready to be bred back sooner.[4]

If a cow isn't eating as often as she should, you can check on her and treat her accordingly. If multiple cows in one pen are experiencing similar issues, you can evaluate your nutrition program and environment. Making the necessary adjustments can help cows get bred back sooner.

03

Stay ahead of feed quality issues

Mycotoxins infect up to 25% of feed crops in the world, resulting in billions in lost revenue and the loss of up to 1.1 billion tons of feed annually.[5] And, mold and mycotoxin issues in the feed are often challenging to diagnose because visual symptoms can be vague and varied.[6]

Activity monitoring data can help identify symptoms of mycotoxins, including lethargy (increased inactivity), reduced feed intake and reduced rumination. Data collected on individual cows and overall herd averages enable you to determine when an issue – like mycotoxins in feed – is affecting a group of cows or the entire herd. Nedap CowControl triggers a group alert when a certain percentage of the cows in a group is showing abnormal behavior of any kind. Reports on the groups eating pattern as well as eating, rumination and inactivity day totals provide insight into feeding and nutrition issues and management.

"The goal of activity monitoring data is to alert you when there's an issue before visual signs appear," says Ebbekink. "We want to be able to pinpoint cows and groups in need of attention faster and more accurately, so that intervention can happen sooner."

[1] The cost of clinical mastitis in the first 30 days of lactation: An economic modeling tool

[2] Responsibility of Agricultural Research in Protecting Public Interests and Benefits

[3] Symptoms of Mastitis

[4] Sensor based eating time variables of dairy cows in the transition period related to the time to first service

[5] Mycotoxins in Crops: A Threat to Human and Domestic Animal Health

[6] Mold and Mycotoxin Issues in Dairy Cattle: Effects, Prevention and Treatment

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Searching for an answer to rising costs? Look to Cow Locating

by **Gerwin Kerkdijk**
Head of sales and business development

Activity Monitoring Systems with Cow Locating help reduce labor and animal care costs

Many dairy farmers are searching for ways to control costs without compromising cow comfort, health or performance. Activity monitoring systems with Cow Locating can help achieve cost savings by streamlining everyday tasks and reducing animal care costs.

"We've seen dairy farms of all sizes turn to activity monitoring systems with cow locating to help offset production costs," says Gerwin Kerkdijk, Head of sales

and business development. "Using an activity monitoring tag, you can track your cow's location and movements in real-time on mobile devices. Knowing the exact location of each cow means you can cut management costs and ensure every cow gets needed care." **>>>**

Cow locating

Make the most out of your veterinarian and AI technician's time

Cow locating technology minimizes human-cow interactions in the dairy barn while also helping to reduce animal care costs. With large animal veterinarian hourly rates totaling over $50 (€42) per hour in 2018,[1] making efficient use of veterinarians' time on-farm through precise cow locating can result in significant cost savings. Cow locating makes it possible to boost efficiency with pregnancy checks and ultrasounds and with as little interaction as possible.

And, with an average hourly wage of $28.53 (€24) for artificial insemination technicians[2], cow locating can result in breeding cost savings as well.

Enhance labor efficiency

Cow Locating can help counter rising labor costs and minimize unpaid labor by reducing the amount of time that daily animal checks require. Labor costs continue to increase for dairy farmers. From 2008 to 2018, the cost of hired labor per cow increased from an average of $118 (€100) to $316 (€267) per year.[3] Additional unpaid work logged by dairy farmers and family members averaged $28,668 (€24,300) in 2018 and carried additional opportunity costs.[4]

"A lot of variables impact how much time dairy farmers spend on animal health checks in barns and free stalls each morning, but Cow Locating has cut time requirements in half for some producers," says Kerkdijk. "Activity monitoring systems generate lists of animals in need of health checks, and Cow Locating enables you to find those cows' exact locations with one simple click."

Reducing time requirements for daily animal checks by just 20 minutes a day would add up to 121 hours in saved labor in one year. At a wage of $15 per hour[5], this would total nearly $1,815 (€1,538) in direct savings per year. And, in addition to reducing labor costs, cow locating provides more time for you to spend growing your business, going to see your kids play sports or perform at a recital.

Example

What does reducing time requirements for daily animal checks by just 20 minutes a day save you?

Saved hours per year
121 hours

Wage
$15 per hour[5]

Yearly saving
$1,815

[1] Occupational Employment and Wages, May 2019

[2] Being an Artificial Insemination Technician

[3] finbin.umn.edu/FinB.dll/generate?RecId=698131

[4] 2018 Iowa Farm Costs and Returns

[5] Wages and Benefits for Farm Employees

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by **Roxie Muller**
Innovation Manager at Nedap

Augmented reality simplifies farm data by bringing it to life

Making farmer's lives easier, augmented reality provides hands-free access to data.

Activity monitoring systems (AMS) have provided useful cow and herd data. But, where does dairy technology go from there? What's on the horizon with farm data? Augmented reality (AR) is not far off and will soon give you the ability to bring data to life, literally.

"Imagine walking through a cow pen looking for cow #134. As if you've entered "Cow #134" into a GPS, a small arrow will point you to her specific location and a screen pops up above her," says Roxie Muller, Nedap innovation manager. "Her health, heat and fertility statistics show up. Now imagine making decisions and immediately implementing them verbally or at the touch of your finger." >>>

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Augmented reality

Herd insights and cow data come to life through Augmented Reality goggles. While it might feel like you're in a real-life video game, these goggles overlay cow insights seamlessly in your field of vision. This gives you access to data where and when it's needed - out in the freestall barn.

"If cow #134 is ready to be bred, simply push a virtual button and she'll be added to the list of other cows that need to be bred," says Muller. "Then, you turn your head to look at another cow, and go through the same pattern. AR is a hands-free, personal-assistant that helps you manage your herd better by bringing data to life."

The best part? AR is simple to implement and use. AR is already used in many sectors, including medical and manufacturing, because it offers an easy way to visualize complex details in real-time, eliminating errors and boosting productivity.[1] The dairy industry is no exception.

Getting ready for AR is easier than you think

For years, AMS technology has helped boost heat detection, conception rates, cow health and labor efficiency. AR leverages AMS data to bring those invaluable cow and herd insights to life. Thanks to the integration with Nedap Cow Locating, the AR insights can be visualized exactly above the right cow.

So, if you use Nedap's CowControl technology with Cow Locating, you already have what you need to implement AR on your farm. After upgrading to the AR service in the near future, the mixed reality goggles can bring your farm's insights to life.

"It's hard to imagine today's dairy farms without advanced technologies," says Muller. "Yet, the technology also has to be farmer-friendly. We believe the combination of AMS and AR are just that."

An internal Wi-Fi network will help make the AMS and AR experience most seamless. With an AR-ready AMS, cow beacons and Wi-Fi, you're ready to make AR a reality on your farm.

AR delivers dairy industry benefits

"We're developing this technology because we see the potential it offers dairy farmers," says Muller. "Whenever you're innovating something new, you expect scepticism. But we've been overwhelmed by the positive response. When farmers try on the goggles for the first time, they immediately see the benefit of being able to visualize relevant cow insights in real-time."

AR also serves as a personal assistant. It allows you to record data and assign treatment protocols using verbal commands or hand gestures. There's no need to manually input data after a long day in the barn – data is input via voice or hand motion while you're walking through pens.

Finally, AR can be used to find a cow you're looking for quickly and efficiently. An arrow will appear in your field of vision and lead you to a cow's exact location in the barn, saving time.

[1] www.ge.com/reports/game-augmented-reality-helping-factory-workers-become-productive/

Watch how we bring herd insights to life in the barn.

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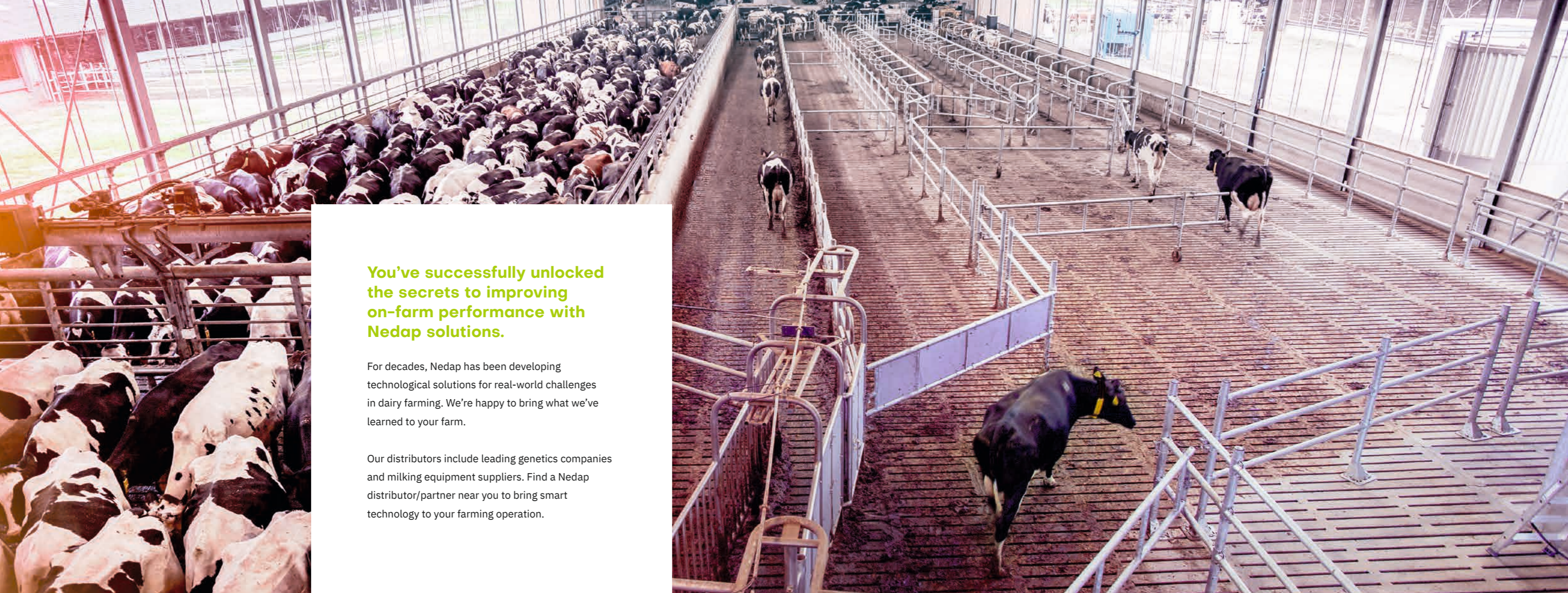
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